Reference Manual

PlantPAx
Process Automation System

Rockwell Automation Library of Process Objects: Central Reset (P_Reset)

Version 3.1

Allen-Bradley • Rockwell Software

Rockwell Automation

Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

Reproduction of the contents of this manual, in whole or in part, without written permission of Rockwell Automation, Inc., is prohibited.

Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

	WARNING: Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
	ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.

Labels may also be on or inside the equipment to provide specific precautions.

	SHOCK HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.
	BURN HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.
	ARC FLASH HAZARD: Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

Allen-Bradley, Rockwell Software, Rockwell Automation, RSLogix, Logix5000, FactoryTalk, PlantPAx, and ControlLogix are trademarks of Rockwell Automation, Inc.

Trademarks not belonging to Rockwell Automation are property of their respective companies.

Preface

Software Compatibility and Content Revision 5
Additional Resources 6

Central Reset (P_Reset)

Guidelines 7
Functional Description 8
Required Files 8
- Controller File 8
- Visualization Files 8

Controller Code 9
- Central Reset Input Structure 9
- Central Reset Output Structure 10
- Central Reset Local Configuration Tags 10

Operations 11
- Modes 11
- Alarms 11
- Simulation 11
- Execution 11
- Implementation by Using EnableIn False Feature 12

Programming Example 14
Display Elements 17
- Graphic Symbols 17
- Using Display Elements 17

Notes:

This document is updated throughout for version 3.1 of the Rockwell Automation Library of Process Objects. Changes for this revision are marked by change bars shown in the right margin.

Software Compatibility and Content Revision

Table 1 - Summary of Changes

Topic	Page
Changed title from 'PlantPAx Library of Process Objects' to 'Rockwell Automation Library of Process Objects'	Front Cover
Changed version of Rockwell Automation Library of Process Objects from 3.0 to 3.1	5, 8
Changed references to Knowledgebase Answer ID 62682 to Product Compatibility and Download Center	5, 8
Visualization Files - added Important note concerning the order in which files must be imported	8
Operations - added Simulation section	11

For the latest compatible software information and to download the Rockwell Automation Library of Process Objects, see the Product Compatibility and Download Center at http://www.rockwellautomation.com/rockwellautomation/support/pcdc.page.

For general library considerations, see Rockwell Automation Library of Process Objects, publication PROCES-RM002.

Additional Resources

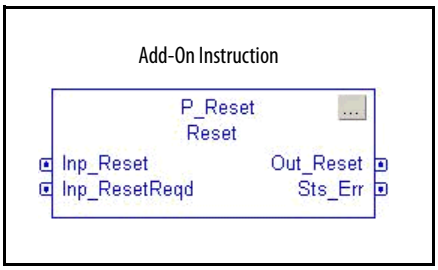
These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
PlantPAx Process Automation System Selection Guide, publication PROCES-SG001	Provides information to assist with equipment procurement for your PlantPAx system.
PlantPAx Process Automation System Reference Manual, publication PROCES-RM001	Provides characterized recommendations for implementing your PlantPAx system.
Rockwell Automation Library of Process Objects, publication PROCES-RM002	Provides general considerations for the PlantPAx system library of process objects.
FactoryTalk View Machine Edition User Manual, publication VIEWME-UM004	Provides details on how to use this software package for creating an automation application.
FactoryTalk View Site Edition User Manual, publication VIEWSE-UM006	Provides details on how to use this software package for developing and running human-machine interface (HMI) applications that can involve multiple users and servers, distributed over a network.
Logix5000™ Controllers Add-On Instructions Programming Manual, publication 1756-PM010	Provides information for designing, configuring, and programming Add-On Instructions.

You can view or download publications at http:/www.rockwellautomation.com/literature/. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Central Reset (P_Reset)

The P_Reset (Central Reset) Add-On Instruction provides a central point for resetting equipment faults. Latched alarms can be reset for a control strategy.



The P_Reset instruction accepts an Operator Reset command, a Program Reset command, and a Reset Input that can come from a push button, from a higher-level P_Reset instruction (from a containing control strategy, such as a Unit Reset sent to a P_Reset at Equipment Module scope), or from any other source.

The P_Reset instruction also includes a Reset Required input for collecting the Ready to Reset outputs of the various instructions it resets and providing a Ready to Reset (Reset Required) status that can illuminate a push button or make an HMI Reset button visible.

The P_Reset instruction includes a timer function that causes its output to be held on for at least a minimum time. This lets the reset signal be sent via physical output cards to field devices that require it (for example, motor drives) and gives time for the cleared status from the device to propagate back to Interlock or Permissive inputs.

Guidelines

Use this instruction in these situations:

- You want a common reset point (Master Reset) for alarms and fault conditions for a control strategy, process unit, process cell or equipment group, process area or plant section, or even a small site. Tie the output of the P_Reset instruction to the Inp_Reset input of the equipment to be reset.
- You want a cascading reset strategy, where there is a P_Reset instruction for a small equipment scope (such as a strategy) that incorporates resets from wider scope (unit, cell, area, site) resets. Tie the output of the higher-level P_Reset instruction to the Inp_Reset input of the lower-level P_Reset instruction.

Do **not** use this instruction when you want to reset a single piece of equipment (valve, motor). Use the Operator or Program Reset command directly on the equipment.

Functional Description

The P_Reset Add-On Instruction provides the following capabilities:

- Reset output for use by other instructions in a control strategy to reset latched alarms (for example, P_AIn analog input alarms) or equipment faults (for example, P_Motor motor faults)
- Operator Reset command for use by the HMI
- Program Reset command for use by control strategies
- Reset input for use by push button inputs or for cascading resets from higher levels of the control hierarchy
- Reset Required input and Ready for Reset output for use in highlighting to operators where a reset is required before the equipment can start
- Minimum On Time for the reset output to allow physical equipment to clear faults and have the clear status propagate through the various permissive and interlock instructions in the control strategy

Required Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix® firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.

Controller File

The P_Reset_3_1-**00**_AOI.L5X Add-On Instruction must be imported into the controller project to be used in the controller configuration. The service release number (boldfaced) can change as service revisions are created.

Visualization Files

The following files for this Add-On Instruction can be downloaded from the Product Compatibility and Download Center at http://www.rockwellautomation.com/rockwellautomation/support/pcdc.page.

IMPORTANT Files must be imported in the following order: image files, global then object files, and then graphic files. This order is required to properly configure the visualization files.

Table 2 - P_Alarm Visualization File Types

Application Type	File Type	FactoryTalk View SE Software	FactoryTalk View ME Software	Description
Graphics - Global Objects	GGFX	(RA-BAS) Process Graphics Library	(RA-BAS-ME) Process Graphics Library	Common global objects used on all process graphics.
Graphics - Displays	GFX	N/A	N/A	N/A

Table 2 - P_Alarm Visualization File Types

Application Type	File Type	FactoryTalk View SE Software	FactoryTalk View ME Software	Description
Graphics - Images	PNG	All .png files in the images folder	All .png files in the images folder	These are the common icons used in the global objects and faceplates for all Process Objects. When PNG graphic formats are imported they are renamed like a BMP file but retain a PNG format.

Controller Code

This section describes the parameter references for this Add-On Instruction.

Central Reset Input Structure

Input parameters include the following:

- Input data elements (Inp_) are typically used to connect field inputs from I/O modules or signals from other objects.
- Configuration data elements (Cfg_) are used to set configurable capabilities and features of the instruction.
- Commands (PCmd_, OCmd_, MCmd_) are used by program logic, operators, and maintenance personnel to request instruction actions.

Table 3 - P_Reset Input Parameters

Input Parameter	Data Type	Default	Description
EnableIn	BOOL	1	**Ladder Diagram:** If the rung-in condition is true, the instruction's Logic routine executes. If the rung-in condition is false, the instruction's EnableInFalse routine executes. **Function Block Diagram:** If true, or not connected, the instruction's Logic routine executes. If the parameter is exposed as a pin and wired, and the pin is false, the instruction's EnableInFalse routine executes. **Structured Text:** No effect. The instruction's Logic routine executes.
Inp_Reset	BOOL	0	Reset Input: 1 = Reset, from a push button or another object.
Inp_ResetReqd	BOOL	1	1 = Reset required, enable Reset button.
Cfg_MinHoldTime	DINT	1	Minimum time to hold Reset output true (seconds).
PCmd_Reset	BOOL	0	Program command to reset, from other object.
OCmd_Reset	BOOL	0	Operator command to reset, from HMI.

Central Reset Output Structure

Output parameters include the following:

- Output data elements (Out_) are the primary outputs of the instruction, typically used by hardware output modules; however, they can be used by other application logic.
- Status data elements (Sts_) are bit outputs of the instruction for use by the HMI. Status bits can also be used by other application logic.
- Ready data elements (Rdy_) are bit outputs of the instruction used by the HMI to enable or disable command buttons and entry fields.

Table 4 - P_Reset Output Parameters

Output Parameter	Data Type	Description
EnableOut	BOOL	Enable Output: The EnableOut signal is not manipulated by this instruction. Its output state always reflects EnableIn input state.
Out_Reset	BOOL	1 = Reset received for this P_Reset scope.
Sts_Err	BOOL	1 = Error in Configuration Invalid Hold Time (use 0…2,147,483).
Rdy_Reset	BOOL	1 = Ready for OCmd_Reset (enables HMI button).
P_Reset	BOOL	Unique Parameter Name for auto-discovery.

Central Reset Local Configuration Tags

Configuration parameters that are array, string, or structure data types cannot be configured as parameters for Add-On Instructions. Configuration parameters of these types appear as local tags to the Add-On Instruction. Local tags can be configured through the HMI faceplates or in RSLogix 5000 software by opening the instruction logic of the Add-On Instruction instance and then opening the Data Monitor on a local tag. These parameters cannot be modified by using controller logic or RSLogix 5000 software export/import functionality.

Tag Name	Data Type	Default	Description
Cfg_Desc	STRING_40	'Multiple-Device Reset'	Description for display on HMI. The string shows in the title bar of the faceplate.
Cfg_Label	STRING_20	'Reset'	Label for graphic symbol displayed on HMI. This string appears on the graphic symbol.
Cfg_Tag	STRING_20	'P_Reset'	Tagname for display on HMI. This string shows in the bottom right of the home tab of the faceplate.

Operations

This section describes the primary operations for the P_Reset Add-On Instruction.

Modes

The P_Reset Add-On Instruction does not have modes and does not contain a P_Mode instruction instance. The Operator and Program reset commands are accepted at any time.

Alarms

The P_Reset instruction provides no alarms. However, the instruction is used to fan out a reset to instructions that have latched alarms.

Simulation

The P_Reset Add-On Instruction does not have a Simulation capability.

Execution

The following table explains the handling of instruction execution conditions.

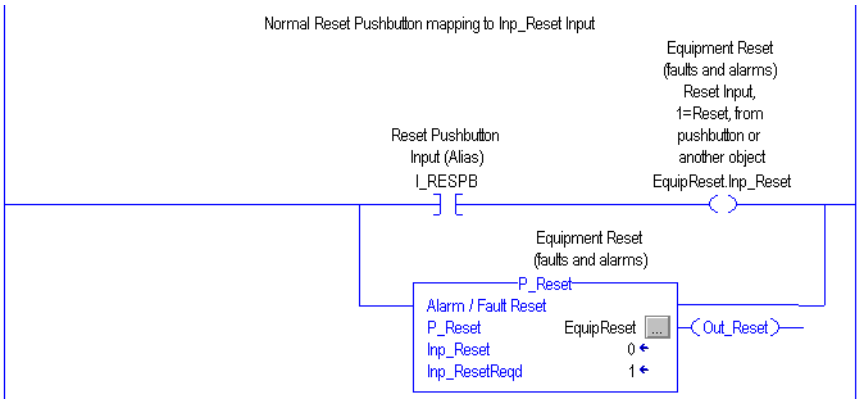
Condition	Description
EnableIn False (false rung) Handling	Sets up a low-to-high transition detection scheme. When the instruction is again scanned as **True**, the transition is detected and the reset output pulses for the required time. Otherwise, EnableIn False processing is identical to normal true rung processing: the Operator Reset command, Program Reset command and Reset Input function as in normal processing. This lets the Reset instruction participate in a control hierarchy by using the Inp_Reset input, yet be tied to a reset push button by using the rung state. See the following section for an example.

Refer to the Logix5000 Controllers Add-On Instructions Programming Manual, publication 1756-PM010, for more information.

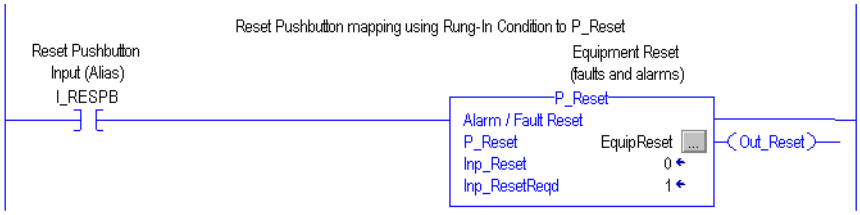
Implementation by Using EnableIn False Feature

For the convenience of Ladder Diagram programmers, the P_Reset instruction can be used in a Ladder Diagram routine with the Input condition carried by the Rung-In condition instead of being mapped on a separate branch.

The following illustration shows normal implementation with the input condition mapped to Inp_Reset on a separate branch.



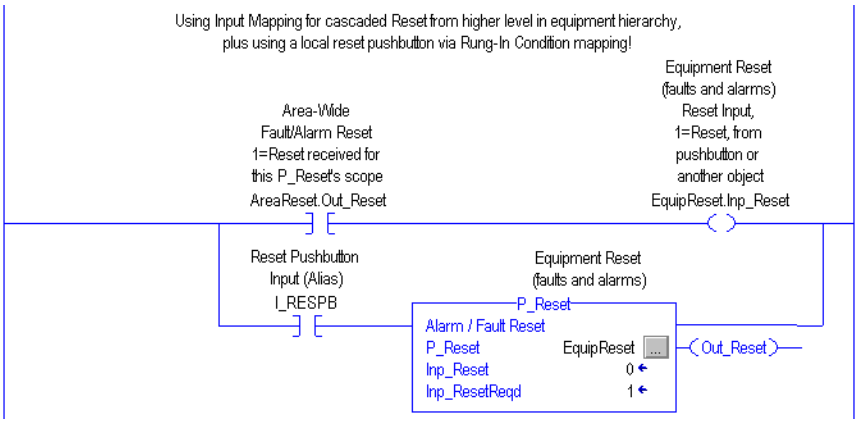
The following illustration shows EnableIn False implementation with the input condition mapped to the P_Reset instruction by using the Rung-In state.



The Rung-In condition determines whether the P_Reset instruction's normal code (Logic Routine) is performed or its EnableIn False code (EnableInFalse Routine) is performed. In the P_Reset instruction, the EnableIn False code is identical to the Logic code, except it also arms a one-shot for the Rung-In condition. When the rung goes **True**, the Logic routine one-shot fires and the Out_Reset output pulses for the configured time, executing a reset.

Use both mapping methods together to provide an additional input to the P_Reset instruction. This is especially useful in an equipment hierarchy, such as in Batch applications (Control Module, Equipment Module, Unit, Cell, Area, and so forth). The Inp_Reset input can be mapped from a higher-level P_Reset instruction, while the local Reset Pushbutton can be mapped by using the Rung-In condition to execute a local equipment reset.

The following illustration shows an EnableIn dual implementation consisting of a high-level reset by using a mapping branch and a local Reset button by using Rung-In state mapping.



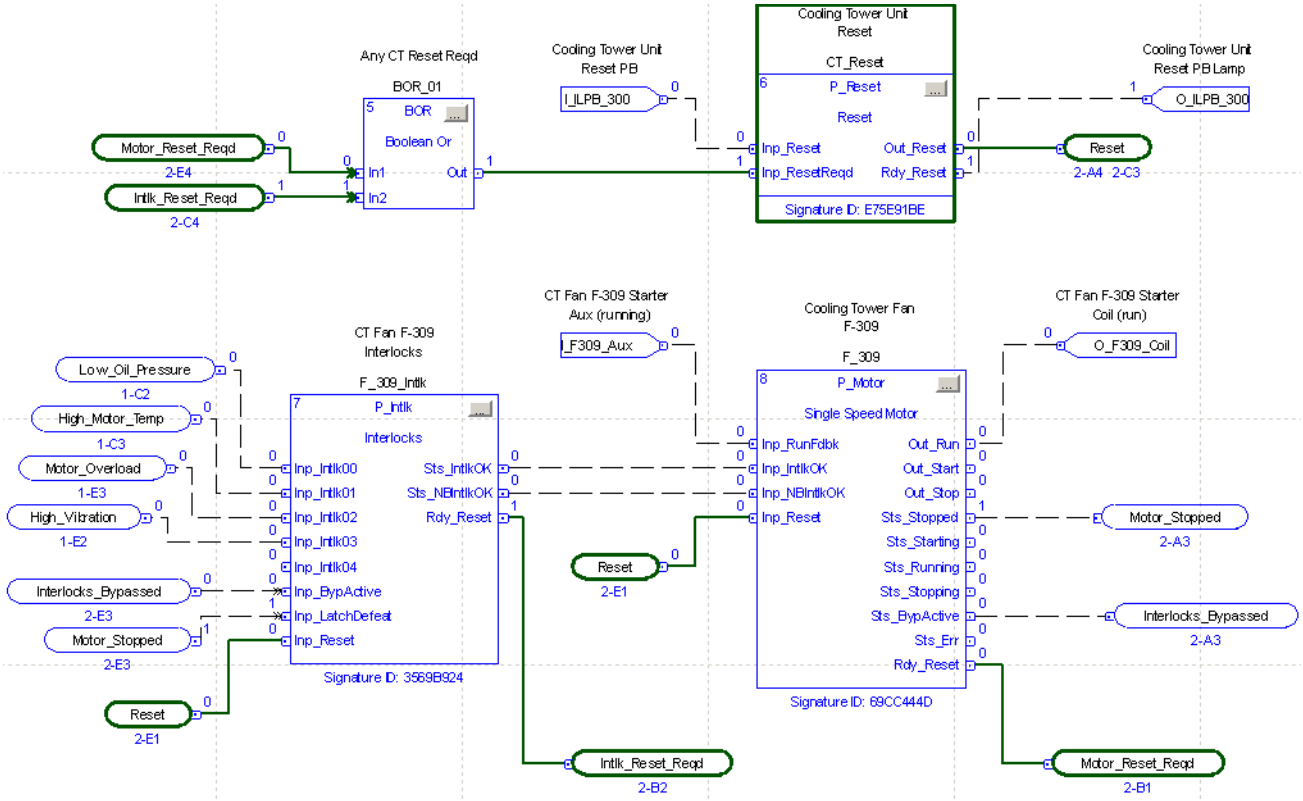
Programming Example

This example adds a unit-wide reset to an existing Function Block Diagram motor control strategy for the fan of a cooling tower in a refinery.

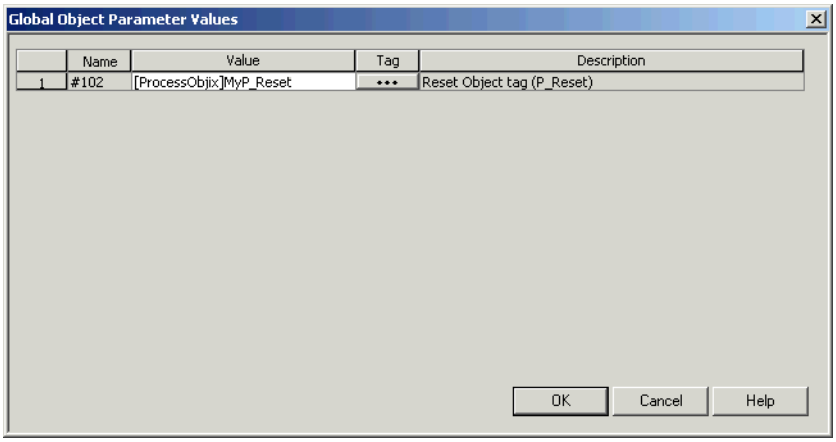
Follow these steps to add the P_Reset instruction to your project.

1. In the Function Block Diagram editor, add a P_Reset instance to the strategy by clicking the Add-On tab of the Language Element toolbar and selecting the P_Reset instruction. Also add a BOR (boolean OR) instruction.
2. Click the generic tagname given to the P_Reset instance (P_Reset_01), then type the tagname you want to give this instance. Right-click the new tagname and choose 'New (tagname)...' and create the tag for this P_Reset instance. In this example, we entered the name 'CT_Reset'.
3. Open the properties of the P_Motor and P_Intlk instructions and expose the Inp_Reset input pin (if not already exposed) and the Rdy_Reset output pin.
4. Connect these pins to inputs of the BOR block. You need to right-click each wire and select the 'Assume Data Available' option to resolve the execution order of the blocks.
5. Open the properties of the P_Reset instruction and be sure the Inp_ResetReqd input pin and Out_Reset output pin are exposed.
6. Connect the Out output of the BOR block to the Inp_ResetReqd input of P_Reset. This signal is true if any block in the strategy requires a Reset.
7. Connect the Out_Reset output of the P_Reset block to the Inp_Reset input of each block in the strategy that will receive the unit Reset. This fans any Reset command received by P_Reset out to the rest of the strategy.

The figure below shows all the additions to the existing motor control strategy to add the unit reset function. It also shows example connections for a hardwired illuminated Reset button.



8. In FactoryTalk View Studio, open the graphic for your motor control strategy.
9. Open the (RA-BAS) Process Graphics Library Global Objects file.
10. Copy the Reset button object from the Global Objects file into your strategy graphic.
11. Right click the object and select 'Global Object Parameter Values'.



12. Press '...' (ellipsis) to open the tag browser.

13. In the tag browser, select the tag CT_Reset and click OK.
14. Save and run your HMI and logic changes.

Now whenever a condition occurs that requires an operator reset, the reset button becomes visible. You can click the button to send a reset to all the blocks in the strategy that need it. Once the reset has propagated through the strategy, the button disappears.

TIP The Mosquito Station sample application included in the Rockwell Automation Library download has a Station Reset toolbar button implemented to illustrate this same method for an entire pump station.

Display Elements

This section describes the Operator Interface for the P_Reset instruction.

Graphic Symbols

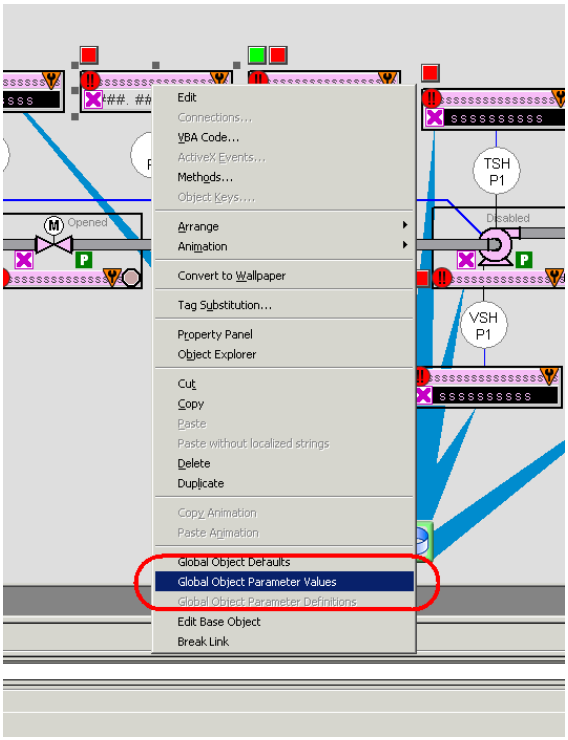
The following table describes the graphic symbols of the P_Reset.

Button	Description
	The same as the reset buttons used in other Process Library Faceplates and screens and is for use on end-user process graphic displays.
	The reset button is inactive.

Using Display Elements

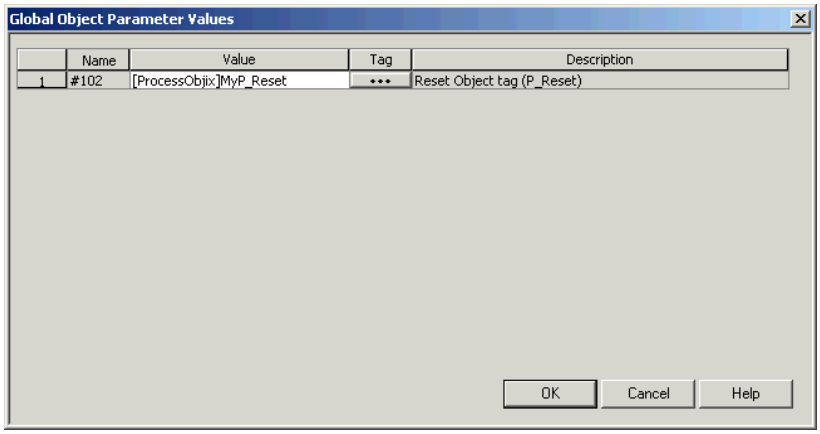
The graphic symbol for the P_Reset instruction can be found in the global object file (RA-BAS) Process Graphics Library.ggfx. Follow these steps to use the graphic symbol.

1. Copy the global object from the global object file and paste it in the display file.



2. In the display, right-click the global object and choose Global Object Parameter Values.

The Global Object Parameter Values dialog box appears.



The global object parameter is as follows.

Parameter	Required	Description
#102	Y	Object tag to point to the name of the associated object Add-On Instruction in the controller.

3. Type the tag or value in the Value column as specified in the Description column.

   TIP Click the ellipsis (. . .) to browse and select a tag.
   Values for items marked '(optional)' can be left blank.

4. Click OK.

Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At http://www.rockwellautomation.com/support you can find technical and application notes, sample code, and links to software service packs. You can also visit our Support Center at https://rockwellautomation.custhelp.com/ for software updates, support chats and forums, technical information, FAQs, and to sign up for product notification updates.

In addition, we offer multiple support programs for installation, configuration, and troubleshooting. For more information, contact your local distributor or Rockwell Automation representative, or visit http://www.rockwellautomation.com/services/online-phone.

Installation Assistance

If you experience a problem within the first 24 hours of installation, review the information that is contained in this manual. You can contact Customer Support for initial help in getting your product up and running.

United States or Canada	1.440.646.3434
Outside United States or Canada	Use the Worldwide Locator at http://www.rockwellautomation.com/rockwellautomation/support/overview.page, or contact your local Rockwell Automation representative.

New Product Satisfaction Return

Rockwell Automation tests all of its products to help ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

United States	Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete this form, publication RA-DU002, available at http://www.rockwellautomation.com/literature/.

Rockwell Automation maintains current product envirSYSLIB-RM008C-EN-Eonmental information on its website at http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page.

Rockwell Otomasyon Ticaret A.Ş., Kar Plaza İş Merkezi E Blok Kat:6 34752 İçerenköy, İstanbul, Tel: +90 (216) 5698400

www.rockwellautomation.com

Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
Europe/Middle East/Africa: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

Publication SYSLIB-RM008D-EN-E - August 2014

Supersedes Publication SYSLIB-RM008C-EN-E - August 2013

Copyright © 2014 Rockwell Automation, Inc. All rights reserved. Printed in the U.S.A.